

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Application No.: 10/784,966
Attorney Docket No.: Q80094

REMARKS

The Office Action of September 27, 2005 has been received and its contents carefully considered.

Claims 1 to 13 are all the claims pending in the application.

The Examiner states that the title of the invention is not descriptive. The Examiner requires a new title that is clearly indicative of the invention to which the claims are directed.

In response, applicant has amended the title to read as follows: ORGANIC LIGHT EMITTING DIODE CONTAINING AT LEAST TWO ORGANIC LAYERS.

Claims 1-11 have been rejected under 35 U.S.C. § 102(e) as anticipated by US Patent 6,756,474 to Hsu.

Applicant submits that Hsu does not disclose or render obvious the subject matter of claims 1 to 11 and, accordingly, requests withdrawal of this rejection.

The present invention as set forth in claim 1 is directed to an organic light emitting diode comprising a substrate, a transparent electrode, at least two organic layers including a light emitting layer and an electron transporting layer, and a back electrode, wherein a thickness of the electron transporting layer is 60 nm or greater, and a total thickness of the electron transporting layer and the light emitting layer is 90 nm or smaller.

The Examiner particularly refers to the disclosure at column 7, lines 47-54, for the thicknesses of the various layers that can be in the electronic devices of Hsu.

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Hsu discloses, at column 7, a device that contains a light emitting layer with a preferred thickness of 10-80 nm and an optional electron transport layer with a preferred thickness of 20-80 nm.

From these disclosures, the Examiner asserts that Hsu discloses an electron transporting layer of 60 nm or greater, since Hsu discloses that the electron transporting layer can have a thickness of 10-80 nm.

In addition, the Examiner asserts that Hsu discloses a total thickness of the electron transporting layer and the light emitting layer of 90 nm or smaller. The Examiner arrives at this conclusion by creating a range of the total thickness of the electron transporting layer and light emitting layer by combining the two lower limits of the preferred ranges (10 nm and 20 nm) to arrive at 30 nm for the lower limit, and by combining the two upper limits of the preferred ranges (80 nm and 80 nm) to arrive at 160 nm for the upper limit. The Examiner then asserts that since the range can be from 30-160 nm, that Hsu discloses a range of 90 nm or smaller.

In response, applicant points out that Hsu does not specifically disclose the 60 nm or greater value for the optional electron transporting layer, or the 30 to 160 nm range for total thickness of the two layers. Applicant submits that the Examiner is employing hindsight to arrive at these values, and the combination of these values.

Further, in addition to the light emitting layer and the optional electron transport layer, Hsu discloses that the device contains a PANI (polyaniline) layer as an essential component of the invention.

The PANI layer of Hsu is described at column 1, lines 17 to 22, as being a hole-injection layer. Thus, the PANI layer of Hsu is considered to be an electron transporting layer.

The PANI layer of Hsu is disclosed at column 7 as having a thickness of 5 to 250 nm, preferably 20 to 200 nm.

The Examiner has completely ignored the presence of the PANI layer. Applicant submits that the PANI layer must be considered when determining the total thickness.

The only example of a device in Hsu which contains a thickness for the layers is Example 3, where Hsu discloses a light emitting diode containing a PANI layer. Example 3 does not disclose an optional electron transporting layer.

Applicant submits that Example 3 does not satisfy the recitations of the present claims because the total thickness of the PANI layer of 140 nm and the emitter layer of 70 nm is greater than 90 nm.

The present specification in Table 1 contains Comparative Examples that show that when the total thickness of the electron transporting layer and light emitting layer is greater than 90 nm, the results of the present invention are not obtained. See Comparative Example 2 and Comparative Example 4.

Applicant submits that Hsu does not specifically disclose the ranges set forth in the present claims, that the Examiner is employing hindsight to arrive at the present claims, that the Examiner has ignored the PANI layer of Hsu, and that the present specification provides evidence that the ranges set forth in the present claims lead to unexpected results.

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In view of the above, applicant submits that Hsu does not disclose or render obvious the subject matter of the present claims and, accordingly, requests withdrawal of this rejection

Claims 12-13 have been rejected under 35 U.S.C. § 103(a) as obvious over Hsu and further in view of US Patent 6,451,130 to Fukuda.

Claims 12 and 13 are dependent claims. Accordingly, applicant submits that they are patentable for the same reasons as discussed above in connection with the patentability of claim 1.

In view of the above, applicant requests withdrawal of this rejection

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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